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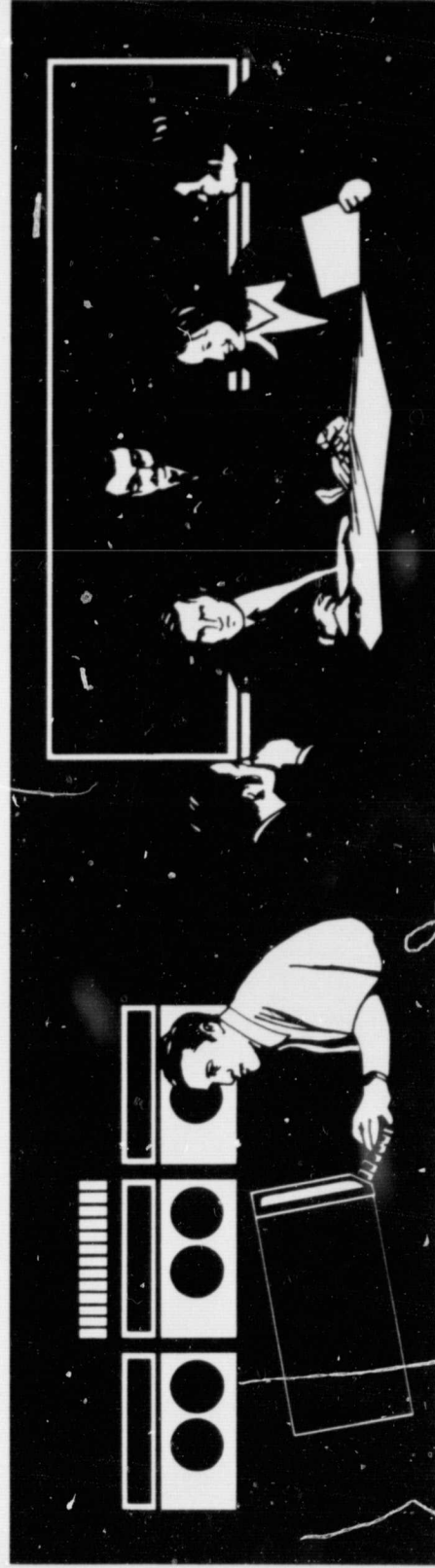
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Earth Resources Satellite Data Applications Series

Sources for Landsat Assistance and Services

Module U-5 January 1980



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Preface

With the increasing interest in Landsat data by the private and public sectors, the availability of pertinent information for potential users is of vital concern. Introduction of the Earth Resources Satellite Data Applications Series of publications is directed toward bridging that gap which often arises between fast-paced technology development and the availability of practical results to the user community. This series of publications is intended to be responsive to needs of the public and private sectors for practical guidance to the disciplinary, functional, and educational uses of Earth Resources Satellite data.

Floyd I. Roberson
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Office of Space and Terrestrial Applications
NASA Headquarters

Sources for Landsat Assistance and Services

Module U-5 January 1980

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Introduction

The intent of this publication is to provide directories of academic and commercial sources to assist the potential user of Landsat data and products. In addition, points of contact for federal and state agencies are provided. The information presented is derived from responses submitted in 1979. The listed entries for academic and commercial sources do not constitute NASA endorsement or preference for the organizations, products, or services mentioned. The directory is selective only to the extent of responses received versus the limited number of questionnaires sent out. Revisions to this publication will be made periodically to accommodate additional organizations which are desirous of being represented and to incorporate additions or corrections. Requests for inclusion or correction should be forwarded to the NASA Office of Space and Terrestrial Applications, Space Applications Branch, Washington, D.C. 20546.

In producing each directory - academic organizations and commercial organizations - information was extracted from individual questionnaire responses. On the lists, the absence of an entry indicates either a negative response or no reply to the questions asked. Because the range and depth of responses varied greatly, the size of individual entries should not be misconstrued to represent the capability of the represented organization. Users are encouraged to make direct inquiries to the individuals named as points of contact.

The questionnaire addressed to **academic organizations** essentially asked for the following information:

1. Name and address of your organization and/or appropriate components. (Include names and telephone numbers of contact persons.)
2. Indicate the educational and research services offered by your organization, as follows:
 - a. Do you offer regular courses in remote sensing and image interpretation?
 - b. Do you offer special courses and programs in remote sensing and image interpretation?
 - c. Do you conduct research in Landsat data processing and analysis?
 - d. Do you provide services in Landsat data applications?
3. List application specialities provided by your organization.
4. Provide additional comments on courses and application areas.

In the directory for academic organizations, the table headings cryptically correspond to the above sequence of inquiries.

The questionnaire addressed to **commercial organizations** essentially asked for the following information:

1. Name and address of your organization and/or components. (Include names and telephone numbers of contact persons.)
2. Indicate the products and services offered by your firm, as follows:
 - a. Do you offer non-digital (optical) image interpretation hardware?
 - b. Do you offer digital image interpretation hardware?
 - c. Do you offer software for Landsat data processing and analysis?
 - d. Do you provide services for Landsat data analysis and applications?
3. List application specialities provided by your organization.
4. Provide additional comments on products and services offered.

In the directory for commercial organizations, the table headings cryptically correspond to the above sequence of inquiries.

Directory of Academic Organizations

Organization and Contact Person	Courses		Research		Services		Comments
	Remote Sensing and Interpretation Regular	Special	Landsat Data Processing	Landsat Data Application	Landsat Data Application	Application Specialties	
Alaska, University of Northern Remote Sensing Laboratory, Geophysical Institute, Fairbanks, Alaska 99701 John Miller (907) 479-7363 William Stringer (907) 479-7455	X	X	X	X	X	Forestry, soils, rangelands assessments; environmental- surveillance, hydrologic and oceanographic assessments; environmental hazard moni- toring; geologic analyses of terrain features, erosion, surface deposits. Remote Sensing Library has extensive holdings of Alaskan satellite imagery and aerial photog- raphy [Ms. Katie Martz (907) 479-7487.]	Arrangements for courses and workshops are made with sponsors; approximately two pro- grams per year. NRSL has a "quick look" capability to receive telefacsimile Landsat imagery to support surveillance of natural events such as fires, floods, ice- pack formations in near real-time.
Arizona, University of Office of Arid Land Studies Applied Remote Sensing Program, 845 N. Park, Tucson, Arizona 85719 Dr. David A. Mouat (602) 626-4715	X	X	X	X	X	Water resources assessment, vegetation analyses and moni- toring, desertification analysis, geologic analysis, soils analysis and mapping.	Special courses offered in remote sensing and digital image pro- cessing, approximately twice per year. Personnel contacts in other university activities and disciplines involving remote sensing are available through Dr. Mouat.

Organization and Contact Person	Courses		Research		Services		Comments
	Remote Sensing and Interpretation, Regular	Special	Landsat Data Processing	Landsat Data	Application	Specialties	
California, University of Remote Sensing Research Program, Rm 260, Space Sciences Laboratory Berkeley, California 94720 Stephen D. DeGloria Robert N. Colwell (415) 642-2351	X	X	X			Agriculture, forestry, hydrology, range science, soil science, inventory design and biometrics, wildlife habitat analysis, wild- lands applications research and demonstrations.	Workshops and courses have addressed the following topics: Applied Remote Sensing for Soil Inventory and Assessment, Intro- duction to Renewable Resource Inventory Methods, Watershed Management, Natural Resource Management. Landsat applica- tion projects include: Irrigated lands assessment, analyst- interpreter aids and procedures, fuel mapping, multiple resource inventory design, water supply from wildlands, and others.
Clemson University Department of Civil Engi- neering Clemson, South Carolina 29631 Dr. Donald B. Stafford (803) 656-3000	X		X	X		Civil engineering applications.	
Colorado State University Earth Resources Depart- ment, Fort Collins, Colorado 80523 Eugene L. Maxwell (303) 491-5147	X	X	X	X		Computer processing of multi- spectral data for agriculture, rangeland, forestry, land use.	Special courses in extracting information from remotely sensed data. Short courses offered once or twice a year in May, August, or January.

Organization and Contact Person	Courses		Research		Services		Comments
	Remote Sensing and Interpretation	Regular	Special	Landsat Data Processing	Landsat Data Application	Application Specialties	
Colorado, University of Institute of Arctic and Alpine Research, Box 450, Boulder, Colorado 80309 Dr. Jack D. Ives (303) 492-7909			X	X	X	Natural hazard phenomena in mountainous areas, environ- mental atlas, wilderness area mapping.	Activities and applications relate to graduate students and National Science Foundation funding of secondary school training projects.
Columbia University Department of Geography New York, New York 10027 Dr. Samuel N. Goward (212) 280-2459, 4641	X			X		Urban, natural vegetation, agriculture, climate.	The remote sensing program supports graduate studies in geography and is cooperative with the Goddard Institute for Space Studies in Earth Resources 2880 Broadway, New York, New York 10027, (212) 678-5511
Cornell University School of Civil and Environ- mental Engineering Remote Sensing Program Hollister Hall Ithaca, New York 14853 Prof. Ta Liang Dr. Warren R. Philipson (607) 256-4330	X			X	X	Primarily manual analyses, multidisciplinary approach, specializing in engineering soils.	

Organization and Contact Person	Courses		Research		Services		Comments
	Remote Sensing Regular	and Interpretation Special	LandSat Data Processing	LandSat Data Application	LandSat Data Application		
Delaware, University of Center for Remote Sensing College of Marine Studies Newark, Delaw are 19711 Dr. V. Klemas (302) 738-2336	X	X	X	X	X	Coastal environment and resources fisheries, water resources and pollution, coastal biological and physical processes, coastal zone management.	Data gathering techniques include satellite, aircraft, and ships using infrared, microwave, or visible spectra sensing devices combined with ground control data collection. MS and PhD degrees, interdisciplinary pro- gram within the College of Marine Studies. National and State internships available.
District of Columbia, University of Geosciences Division, Department of Earth/ Life Sciences Building 37, Room 308 4200 Connecticut Ave. NW. Washington, D.C. 20008 Profs. J. V. O'Connor and C. F. Withington (202) 282-7351	X		Limited			Fluvial geomorphology, structural geology, land use planning, environmental geology	Programs oriented for secondary teachers, state, county, or city systems. Two educational pro- grams are available.

Organization and Contact Person	Courses			Research			Services			Comments
	Remote Sensing and Interpretation	Regular	Special	Landsat Data	Processing	Data	Landsat Data	Application	Application Specialties	
Florida, University of Remote Sensing Applica- tion Laboratory Department of Civil Engineering, 346 Weil Hall Gainesville, Florida 32611	X				X		X		Geological and engineering studies including terrain analysis, site selection, land use, hydrology, hydraulics, coastal zones.	
Dr. Byron E. Ruth (904) 392-6590, 0933										
Janet Degner (904) 392-1436, Ext. 38										
Georgia Institute of Technology, Engineering Experiment Station Atlanta, Georgia 30322			X		X		X		Forestry, geology, land use/ cover mapping, geographic data bases.	Short course entitled <i>Recent Advances in Remote Sensing</i> , offered jointly with the Uni- versity of Georgia, twice per year.
Nick Faust (404) 894-3357										
Georgia, University of Department of Geography Athens, Georgia 30602	X		X		X		X		Geography, land use/cover mapping, water resources. Emphasis on processing and analysis of Landsat data in digital formats.	(See above comment for Georgia Institute of Technology)
Prof. Roy Welch (404) 542-2856										

Organization and Contact Person	Courses			Research		Services		Comments
	Remote Sensing and Interpretation Regular	Special	Application	Processing	Data	Application	Specialties	
Humboldt State University Remote Sensing Arcata, California 95521 Lawrence Fox (707) 826-4874 Donna Hankins (707) 826-3112	X	X	X	X	X	X	Natural resource vegetation mapping and classification.	Initial course presented entitled <i>Air and Space Technology in the Forest Environment.</i>
Idaho, University of Department of Geography Cart-O-Graphics Laboratory Moscow, Idaho 83843 Dr. Alan DeLucia Dr. Sam Scripser (208) 885-6216	X	X		X			Mapping and cartography, geographic information systems.	Workshop entitled <i>Down- to-Earth Applications of Orthophotos.</i>
Illinois, University of Spatial Data Analysis Laboratory Department of Geography 220 Davenport Hall Urbana, Illinois 61801 Thomas Frank (217) 333-1880	X			X	X	X	Optical and machine processing.	Special courses under development
Iowa, University of Department of Geology Iowa City, Iowa 52242 Dr. Richard A. Hoppin (319) 353-4448	X	X					Remote sensing seminar and independent study.	Co-located with Iowa Geological Survey which is expanding remote sensing capabilities

Organization and Contact Person	Courses		Research		Services		Comments
	Remote Sensing and Interpretation		Landsat	Data	Landsat	Data	
	Regular	Special	Processing	Application	Application	Specialties	
Kansas, University of Center for Research, Inc. 2291 Irving Hill Drive Campus West Lawrence, Kansas 66045 Dr. Louis F. Dellwig (913) 864-4832	X		X			Geology, botany.	Remote sensing course offered jointly each spring by Depart- ments of Geology and Electrical Engineering, emphasis on radar.
Louisiana State University Division of Engineering Research Remote Sensing and Image Processing Laboratory 3418 Ceba, Baton Rouge, Louisiana 70803 Dr. Charles A. Whitehurst Dr. Jack Hill (504) 388-8417	X	X	X		X	Land use and water quality relationships, coastal processes, water quality	Remote sensing short course (digitally oriented) offered to Corps of Engineers personnel Image processing system handles NOAA, TIROS, and Landsat digital data.
Miami, University of Remote Sensing Laboratory Department of Mechanical Engineering P.O. Box 248003 Coral Gables, Florida 33124 Dr. H. W. Hisar (305) 284-3881	X	X	X			Thermal infrared, solar energy monitoring, rainfall measure- ment, soil moisture monitoring.	Conferences on remote sensing conducted at irregular intervals

Organization and Contact Person	Courses				Research		Services		Comments
	Remote Sensing and Interpretation Regular	Special	Processing	Application	LandSat Data	LandSat Data	Application	Specialties	
Michigan State University Remote Sensing Project 201 UPLA Building East Lansing, Michigan 48824	X	X	X	X	X		X	Visual interpretation and enhancement of Landsat imagery. Land cover/use and forest resources inventory. Geographic information systems.	Remote sensing familiarization workshops for public officials, ad hoc special training in remote sensing and image interpreta- tion for participants of on-going international projects.
William R. Enslin (517) 353 7195									
Dieter Brunnenschweiler, Geog. Dept. (517) 353-1686									
Michigan, University of School of Natural Resources Remote Sensing Program 1032 S.T. Dana Building Ann Arbor, Michigan 48109	X	X	X	X	X		X	Vegetation/habitat mapping, forestry, early detection of stress in forest stand, resource inventory (surveys) and sampling design, land use analysis.	Annual (mid-June) workshop on vegetation remote sensing.
Dr. Charles E. Olson, Jr. (313) 764-1413									
Minnesota, University of 103 Space Science Center 100 Union Street S.E. Minneapolis, Minnesota 55455	X		X		X		X	Forestry, water quality, land use.	Remote sensing and usage interpretation short course given occasionally (Prof. Lillesand).
Prof. Russel K. Hobbie (612) 373-5479									
Prof. T. Lillesand (612) 376-8177									

Organization and Contact Person	Courses		Research		Services		Comments
	Remote Sensing Regular	and Interpretation Special	Landsat Data Processing	Landsat Data	Application	Application Specialties	
Mississippi State University Remote Sensing Applica- tions Program Department of Forestry P.O. Drawer FD Mississippi State, Mississippi 39762 W. Frank Miller (601) 325-2946	X	X	X	X	X	Application of aerial photog- raphy and Landsat digital imagery to environmental resource problems, particularly surface coal mining assessment, and integration of remotely sensed data with geo-information systems.	In response to demand, short courses and training seminars have been offered in photo interpretation, remote sensing, use of data base management systems, and digital processing of Landsat data.
Missouri, University of Department of Mining, Petroleum, and Geological Engineering School of Mines and Metallurgy Rolla, Missouri 65401 Dr. David J. Barr (314) 341-4751	X	X	X	X	X	Land use mapping, geological engineering applications, surface mining reclamation, underground mining subsidence, exploration.	Digital image processing workshops and seminars.

Organization and Contact Person	Courses		Research		Services		Application Specialties	Comments
	Remote Sensing and Interpretation	Regular	Special	Landsat Data Processing	Landsat Data Application	Landsat Data		
Nebraska, University of Remote Sensing Center Conservation and Survey Division 113 Nebraska Hall Lincoln, Nebraska 68588 Dr. Rex M. Peterson (402) 472-3471	X			X		X	Lineament studies and geologic interpretation for minerals, petroleum exploration, color infrared studies of crop stress, land use mapping, center pivot and irrigated land inventory (Dr. Hoffman)	
Dr. Otto Hoffman, Dept Industrial and Management Systems Eng (402) 472-1389								
New York, State University at Albany Department of Geography Albany, New York 12222 Dr. Floyd M. Henderson (518) 457-8726	X		X			X	Land use, resource analysis, urban problems (population, energy use), agriculture monitoring, forest inventory	
New York, State University at Syracuse College of Environmental Science and Forestry Bray Hall Syracuse, New York 13210 Dr. Michael J. Duggin (315) 473-8798 Dr. R. Brock (315) 473-8921	X		X	X		X	Disease stress mapping (area quantification), crop type, area and yield mapping, cartographic registration of imagery, calibration procedures, studies of physical factors affecting remote sensing process	

Organization and Contact Person	Courses			Research		Services		Comments
	Remote Sensing and Interpretation Regular	Special	Landsat Data Processing	Landsat Data Application	Specialties	Application	Specialties	
North Dakota, University of Institute for Remote Sensing P.O. Box 8086 University Station Grand Forks, North Dakota 58202	X	X	X	X		X	Land use, environmental monitoring, agro productivity, mine reclamation.	Annual workshop, <i>Introduction to Remote Sensing</i> , and Symposium, <i>Innovations in Land Use Management</i>
Dr. Roland D. Mower (701) 777-4246								
Northern Arizona University Department of Geography Box 15016 Flagstaff, Arizona 86011	X	X	X	X		X		
Dr. Howard Salisbury or Dr. Graydon Berlin (602) 523-2650								
Oregon State University Environmental Remote Sensing Applications Laboratory (ERSAL) Corvallis, Oregon 97331	X			X		X	Natural vegetation mapping, agricultural land use inventory, wildlife habitat mapping, irrigated land and wetland mapping, natural area inven- tory, pre/post forest fire analysis	Training program in digital image processing, <i>Landsat Data Analysis Workshop</i> , offered twice per year.
Dr. Barry Schrumph (503) 754-3056								

Organization and Contact Person	Courses			Research		Services		Application Specialties	Comments
	Remote Sensing and Interpretation	Regular	Special	LandSat Data	Processing	LandSat Data	Application		
Pennsylvania State University Office for Remote Sensing of Earth Resources (ORSER) 219 Electrical Engineering West University Park, Pennsylvania 16802 Dr. G. J. McMurty Dr. G. W. Petersen (814) 865-9753	X		X		X		X	Development of remote sensing techniques, problem oriented rather than discipline oriented. Emphasis is on digital methods. ORSER processing system is accessible by remote terminals; ORSER software for image processing is available for purchase.	Several short courses have been offered on computer processing of Landsat data and related subjects.
Purdue University Laboratory for Application of Remote Sensing (LARS) Purdue Research Park 1220 Potter Drive West Lafayette, Indiana 47906 Douglas B. Morrison (317) 749-2052	X		X		X			Agriculture, forestry, land use, water resources, geology.	A variety of short courses and symposia are offered periodically such as <i>Numerical Analysis of Remote Sensing Data</i> and <i>Machine Processing of Remotely Sensed Data</i> .
South Dakota State University Remote Sensing Institute Harding Hall Brookings, South Dakota 57007 Dr. Donald Moore (605) 688-4184	X		X		X		X	Natural resources surveys and management.	Education and training activities are conducted typically through the Visiting International Scientist Program. This training is tailored to the needs of the visiting scientist and may last from a few weeks to a year.

Organization and Contact Person	Courses		Research		Services		Comments
	Remote Sensing and Interpretation	Regular	Special	LandSat Data Processing	LandSat Data Application	Application Specialties	
Southern California, University of Image Processing Institute University Park Los Angeles, California 90007	X		X	X	X	Image processing and under- standing: coding, enhancement, restoration, image analysis, feature extraction, segmenta- tion, symbolic description.	Short courses offered are <i>Digital Image Processing</i> and <i>Digital Image Analysis</i> and <i>Pattern Recognition</i>
Eileen Jurak (213) 741-5506							
Stanford University Remote Sensing Laboratory Department of Applied Earth Sciences Stanford, California 94305	X		X	X		Exploration geology (minerals and oil), geostatistics.	
Prof. R. L. P. Lyon (415) 497-0847							
University of Tennessee Space Institute Remote Sensing Division Tullahoma, Tennessee 37388	X		X	X	X	Wetlands research, land use survey, strip mine survey, information systems.	Full time graduate study. MS, PhD in Engineering Science, courses offered every quarter. University of Tennessee fees apply. Annual conference on Remote Sensing of Earth Resources. Also, Tech- nology Development Corporation, P.O. Box 22027, Nashville, TN 37202, provides special courses by arrangement, considering student background, location, duration, and equipment needs (Dr. Shahrokhi)
Dr. F. Shahrokhi (615) 455-0631, Ext. 241							

Organization and Contact Person	Courses			Research		Services		Comments
	Remote Sensing Regular	and Interpretation Special	Land Data	Processing	Land Data	Application	Application Specialties	
Texas A&M University Remote Sensing Center College Station, Texas 77843 Dr. Bruce Blanchard Dr. Richard Newton (713) 845-5422	X	X	X	X	X	X	Modeling urban spatial processes, ground water draw- down, soil moisture measurement, coastal processes, range biomass, international forest resources, digital analysis, modeling shifting cultivation in tropical forests.	Short courses given depending upon demand.
Texas, University of Department of Geography Austin, Texas 78712 Dr. Robert K. Holz (512) 471-5117	X	X					Hydrology, land use and land form mapping.	Three courses offered, including research at the graduate level.
Utah, University of Department of Geography Salt Lake City, Utah 84112 Dr. Roger M. McCoy (801) 581-8218	X			X		X	Land use mapping vegetation cover, environmental analysis.	
Washington, University of Department of Civil Engineering 121 More Hall, FX-10 Seattle, Washington 98195 Prof. J. E. Colcord (206) 543-2684	X	X		X		X	Thermal infrared analyses.	Main educational program areas are: Photogrammetry and Remote Sensing; Engineering and Cadastral Surveying.

Organization and Contact Person	Courses			Research		Services		Comments
	Remote Sensing and Interpretation Regular	Special	Processing	Landsat Data	Application	Landsat Data	Application	
Wisconsin, University of Institute for Environ- mental Studies 1210 Engineering Building Madison, Wisconsin 53706	X	X	X	X	X			Short course offered in remote sensing (Introductory)
Prof. Ralph W. Kiefer (608) 262-1405								
Wisconsin, University of Remote Sensing Program Department of Geography and Geology Stevens Point, Wisconsin 54481	X							
Clarence J. Milfred (715) 346-4324								
Wright State University Department of Geography Dayton, Ohio 45435	X	X		X				Instruct: on offered in digital image processing. Special courses in remote sensing, cartography, map/photo interpretation, geographic applications of remote sensing
Dr. John R. Ray (513) 873-2834								

Directory of Commercial Organizations

Organization and Contact Person	Hardware			Software		Services		Application Specialties	Comments
	Remote Sensing and Interpretation	Digital	Optical	Landsat Analysis & Processing	Landsat Data	Landsat	Data		
Aero-Metric Engineering, Inc. 4708 North 40th Street Sheboygan, Wisconsin 53081			X					Aerial photographic data collection and photo lab available for use with processing/analysis of Landsat data.	
Donald G. Mohr (414) 457-3631									
Aero Service 8100 Westpark Houston, Texas 77063				X		X		Geologic mapping/interpretation, oil/gas/mineral exploration, water depth mapping, land cover/use mapping.	Color additive composites, color ratio composites, filtered (edge enhanced) images, classified (sorted) images, and mosaics are available.
Bob Norris (713) 784-5800									
Air Photographics, Inc. Sales and Flight Office Route 4, Box 50C Martinsburg, West Virginia 25401						X		Aerial photography within 500 mile radius of Washington, D.C. Production of large scale imagery (enlarged).	Services include: an aerial photo print library [(301) 588-2788] indexing local counties and adjacent states, a complete photographic laboratory [(703) 338-7101].
Dixie Chrisman (304) 263-6976									
Alan Gordon Enterprises, Inc. 5362 Cahuenga Blvd. North Hollywood, California 91601			X						
Don Sahelin (213) 985-5500									

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing Optical	and Interpretation Digital	Landsat Processing	Landsat Analysis & Data	Landsat Application	Landsat Data	
Autometric, Inc. 5205 Leesburg Pike Suite 1308 Skyline 1 Falls Church, Virginia 22041	X		X	X			Generic remote sensing applications may encompass future satellite imaging programs.
Dennis Springer (703) 998-7606							
Aydin Controls 414 Commerce Drive Fort Washington, Pennsylvania 19034		X					Aydin Systems Division provides installation of turnkey earth station facilities. Contact: Vasant N. Sawant, (415) 968-7680, Ext. 221.
Jerry Hughes (215) 542-7800							
Battelle, Pacific North- west Laboratories Battelle Boulevard Richland, Washington 99352					X		Color graphics display systems
Lou M. Martucci George E. Wukelic (509) 942-5865, 5860							Principally involved in geologic interpretations of remote sensing data and developing computer techniques for merging remote sensing and geoscience data.
Bausch and Lomb, Inc. 1400 N. Goodman Street Rochester, New York 14602	X						Zoom Transfer Scope equipment can be used with digitizing systems for revision or updating of data bases.
Rex McHail (716) 338-6466							

Organization and Contact Person	Hardware		Software		Services		Application Specialties	Comments
	Remote Sensing and Interpretation Optical	Digital	Landsat Analysis & Processing	Landsat Data	Application			
Bechtold Satellite Technology Corporation 17137 East Gale Ave. City of Industry, California 91745	X				X	Services include 16 x 20" hard copy color prints as report enclosures or special products. Specialize in correlation of Landsat, Skylab, U-2, Apollo, Gemini, SLAR, and aircraft data for geological studies.	Consultative/advisory service and field work available in geology and geophysics.	
Ira C. Bechtold (213) 965-7353								
Broomall Industries 700 Abbott Drive Broomall, Pennsylvania 19008	X				X	Automatic digitizing services for ground truth data capture.		
Philip R. Gatto (215) 328-1040								
Burke & Associates, Inc. Environmental Division 4176 Canal Street New Orleans, Louisiana 70119	X				X	Wetland, vegetation, land use photo interpretation of color IR high altitude and satellite imagery. Terrain analysis and suitability mapping.		
Dr. Paul R. Wagner (504) 486-5901								
Cartwright Aerial Surveys, Inc. Executive Airport Sacramento, California 95822	X				X	Remote sensing data acqui- sition and interpretation: multispectral, radiometry, thermal IR, interactive graphics, photogrammetric and photo- graphic processing services.		
Vern W. Cartwright (916) 421-3465								

Organization and Contact Person	Hardware, Remote Sensing and Interpretation		Software Landsat Analysis & Processing		Services Landsat Data		Application Specialties	Comments
	Optical	Digital			Application			
CH2M Hill 1525 Court Street Redding, California 96001 Kent Rozelle Steve Lytle (916) 243-5831					X		Development of resource information systems, including: vegetation/forestry, land use/cover, agricultural lands.	
COMARC Design Systems, Inc. 315 Bay Street San Francisco, California 94133 Bill Soby (415) 392-5300			X		X		Merging of Landsat data into levels of geo-referenced data for multi-resolution data integration into a coherent data base. "Training" of unclassified (not sorted) data.	Turnkey, full color graphics, hardware/software package available in proprietary programs.
Commonwealth Associates, Inc. 209 E. Washington Ave. Jackson, Michigan 49201 William W. Schivley (517) 788-3567	X				X		Non-digital interpretation of Landsat images for general land-use patterns (routing studies).	
COMTAL Corporation P.O. Box 5087 Pasadena, California 91107 Harry C. Andrews Ken G. Marshall (213) 793-2134		X	X		X		Real time interactive digital image exploration equipment, multi-band image combination, image convolution, pixel classification.	Stand-alone capability (mag. tape input) or interfacing with multiple host machines, 12K firmware operating system, 16K user software programming area.

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing and Interpretation Optical	Digital	Landsat Analysis & Processing	Landsat Data	Application	Specialties	
Dames & Moore 7101 Wisconsin Ave. Washington, D.C. 20014 A. D. Beccasio (301) 652-2215			X	X		Siting studies for power plants, transmission line corridors and waste disposal facilities, geological and geochemical investigations; surface water hydrology and flood plain mapping; mineral resources exploration; environmental assessments; land resources data base generation using Landsat digital data.	Landsat analog and digital data products combined with aerial data such as black and white, color, infrared, multiband, thermal, and SLAR imagery.
De Arza Systems 118 Charcot Ave. San Jose, California 95131 John E. Sample (408) 263-7155	X		X			Image processing, image display, data capture.	
DBA Systems, Inc. P.O. Drawer 550 Melbourne, Florida 32901 John Schumann (305) 727-0660	X		X	X		Image enhancement, feature extraction, metric data reduction, calibration.	
DICOMED Corporation 9700 Newton Avenue South Minneapolis, Minnesota 55431 (612) 887-7100	X		X			Film recorders and graphic COM systems, operating software.	

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing Optical	Interpretation Digital	Landsat Analysis & Processing	Landsat Data	Application	Specialties	
Earth Resources Data Analysis Systems, Inc. (ERDAS), 999 McMillan Street NW Atlanta, Georgia 30318 Lawrie Jordan Jim Wilson (404) 872-7327	X		X		X	Forestry, agriculture, energy corridor (power transmission lines, etc.), surveys, industrial site location, resources inventory (wildlife habitats).	Low cost micro-computer based Landsat processing hardware/ software and related services are available.
Earth Satellite Corporation 7222 47th Street Chevy Chase Washington, D.C. 20015 H. Robert Gribben William Brooner (301) 652-7130			X		X	Hydrocarbon/minerals explora- tion, land cover/use, surface and ground water, vegetation and forest inventories, weather and crop forecasting, agricul- tural and range potential analyses, urban planning/ transportation/routing.	Capabilities include: crop yield and production fore- casting services, geobase resource management information system, digital enhancement of Landsat images.
Ecographics International Environmental Analysis P.O. Box 706 La Jolla, California 92038 Ralph Brown (714) 226-1259					X	Consultation in remote sensing, and interpretive services for ecological appli- cations. Specialties in resource inventory, wildlife/habitat analysis, and wildlife reserve planning.	

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing and Interpretation	Optical	Digital	Landsat Analysis & Processing	Landsat Data	Application Specialties	
EG & G, Washington Analytical Center, Inc. P.O. Box 476 Pocomoke City, Maryland 21851				X		X	Principal type of analysis presently performed is with GEOS-3 radar altimeter.
Ronald L. Brooks (301) 957-2484							
Environmental Research and Technology, Inc. 696 Virginia Road Concord, Maryland 01742	X		X	X		X	Snow and sea ice mapping, land use studies, forest type mapping, siting and impact assessment studies.
Michael D. Smallwood (617) 369-8910							
Environmental Research Institute of Michigan P.O. Box 8618 Ann Arbor, Michigan 48107				X		X	Bathymetry, wetlands, forestry, agricultural, water quality, geology, wildlife habitat, resource management, planning.
Don Lowe Bob Rogers (313) 994-1200							Remote sensing data col- lection and interpretation services, environmental resource analysis, mapping, information management technology.
Environmental Systems Research Institute (ESPRI) 380 New York Street Redlands, California 92373	X			X		X	Photo interpretation, geo- based information systems (design and implementation), geo-based software, digitizing services.
Jack Dangemond Bill Mateson (714) 793-2853							Extensive experience in development of geographic automated information systems.

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing and Interpretation	Optical	Digital	Landsat Analysis & Processing	Landsat Data	Application	
Envirosphere Co. 19 Rector Street New York, New York 10066 Fred Shanholtzer (212) 785-6065		X		X	X	Terrestrial ecology, land use, mining, seismology.	Environmental assessments and resources inventories (a division of Ebasco Services).
Exotech Inc. 1200 Quince Orchard Blvd. Gaithersburg, Maryland 20760	X					Four channel ground truth radiometer designed specifically for users of Landsat multi- spectral scanner imagery.	
R. D. Sadler (301) 948-3060							
Exploration Research Associates Inc. 1701 Clinton Street, Suite 212 Los Angeles, California 90026 Mark Liggett (213) 483-5127	X			X	X	Geotechnical mapping and exploration for minerals, metals (industrial), geothermal energy and ground water.	Integration of remote sensing techniques with geological, geophysical, and geochemical survey methods.
Ford Aerospace & Com- munications Corp. Space Information Systems Operation P.O. Box 58487 Houston, Texas 77058 Norm Hines (713) 332-8352		X		X	X	Systems and related service to support inventory of world- wide wheat production using Landsat and NOAA data	Remote sensing data analysis techniques and equipment have been developed under contract to provide a Landsat ground station to India.

Organization and Contact Person	Hardware		Software		Services		Application Specialties	Comments
	Remote Sensing Optical	Interpretation Digital	Landsat Analysis & Processing	Landsat Data	Landat Data	Landat Data		
General Electric Co. 5030 Herzel Place Beltsville, Maryland 20705 Jon S. Melnyk W. Kent Stow (301) 937-3500	X		X	X			Geology, hydrology, land use, resource management, meteorology, agriculture, mining, forestry, transpor- tation, oceanography.	Full services available in consulting, discipline assistance, applications, digital image enhancement, photo interpretation and production, hardware and soft- ware systems.
Geo Space Corporation P.O. Box 36374 Houston, Texas 77036 Jerry Sautter (713) 666-1611		X	X				Landsat data hardcopy displays (4' x 5')	Image recording and digital plotting systems available.
Geospectra Corporation 320 N. Main Street Suite 301 Ann Arbor, Michigan 48104 Dr. Robert K. Vincent (313) 994-3450			X		X		Mineral/petroleum explora- tion, environmental geology, range management, cartog- raphy, water depth mapping, hydrology, oil slick mapping.	
Grinnell Systems Corp. 2159 Bering Drive San Jose, California 95131 James G. MacKnight (408) 263-9920	X							

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing and Interpretation	Optical	Digital	Landsat Analysis & Processing	Landsat Data	Application Specialties	
Honeywell Inc. Systems and Research Center 2600 Ridgway Parkway Minneapolis, Minnesota 55413 Dr. Mel Geokeyas (612) 378-5095	X		X	X		Generic research and develop- ment in pattern recognition technologies.	
HRB Singer, Inc. P.O. Box 60, Science Park State College, Pennsylvania 16801 P. P. Cassara R. A. Armstrong (814) 238-4311	X		X	X	X	Surface mining, reclamation, abandoned mine land inven- tories, water resource inventories, waterways monitoring, geologic hazard zone maps, wildlife habitat and land use inventory and analysis.	Remote sensing expertise in: species identification, frequency, density; percent cover and biomass; image enhancement; image density analysis; multi-spectral computer analysis; classi- fication techniques; digitization techniques.
Interpretation Systems Incorporated 6322 College Blvd. Overland Park, Kansas 66211 Jerry D. Lent (913) 642-8700	X		X	X		Hardware and software systems designed for digital image analysis	Systems are provided that feature user interaction without computer knowl- edge specialization and pixel encoding/display in visually independent parameters of perception (intensity, hue, and saturation).
Itek Corporation 10 Maguire Road Lexington, Massachusetts 02173 Don Oliver (617) 276-2000	X		X		X		

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing and Interpretation	Digital	Landsat Analysis & Processing	Landsat Data	Application	Specialties	
Keuffel & Esser Company 20 Whippany Road Morristown, New Jersey 07960 (201) 285-5000	X	X				Hardware for photogram- metry (may be useful in remote sensing analysis).	
Lafayette Data Control P.O. Box 2023 West Lafayette, Indiana 47906 Stephan G. Luthur (317) 743-9983	X	X	X	X		Forestry, land use, geology, water resource, change detection, map overlays.	
Lamar-Merifield, Geologists 1318 Second Street, #27 Santa Monica, California 90401 Dr. Paul M. Merifield (213) 395-4528	X			X		Geological interpretation.	
Lexidata Corp. 215 Middlesex Turnpike Burlington, Massachusetts 01803 (617) 273-2700	X					Video image processing system.	
Lockheed Electronics Co. 1830 NASA Road 1 Houston, Texas 77058 Robert E. Tokerud Lowell H. Brigham (713) 333-6115	X	X	X	X		Crop analysis; forest inventory, urban/rural land cover classifi- cation; wetlands mapping; image enhancement/interpretation for geologic features; aerial photo planning and interpreting; consulting/designing for hard- ware/ software systems and data base/image analysis.	Capabilities in remote sensing and earth resources related technologies applied in projects with federal, state, and local agencies.

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing and Interpretation	Optical	Digital	Landsat Analysis & Processing	Landsat Data Application	Specialties	
MacDonald, Dettwiler & Associates, Ltd. 10280 Shellbridge Way Richmond, British Columbia, Canada V6X 2Z9 Barclay Isherwood (604) 278-3411	X			X			
Martin Marietta Corp. High Density Digital Recorders P.O. Box 179, M/S S0473 Denver, Colorado 80201 Richard Parker (303) 973-3149	X						High density digital recorders, produced for EROS Data Center and Goddard Space Flight Center, are tape compatible.
Metrics, Inc. 290 Interstate North Suite 116 Atlanta, Georgia 30339 G. William Spann (404) 955-1975				X	X	Land use, water resources.	Specialization in remote sensing market research.
Michael Baker, Jr., Inc. 4301 Dutch Ridge Road P.O. Box 280 Beaver, Pennsylvania 15009 William O. Baker (412) 495-7711	X		X		X	Land use classification and mapping, water resources, geologic resources.	In-house photogrammetric services and data processing facilities available. Digital analysis utilizes Pennsylvania State University's ORSER software package.

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing and Interpretation	Optical	Digital	Landsat Analysis & Processing	Landsat Data	Application Specialties	
Oceanographic Services, Inc. P.O. Box 6783 Santa Barbara, California 93111 (805) 685-4521					X	Remote sensing of sea ice data.	
Optronics International, Inc. 7 Stuart Road Chelmsford, Massachusetts 01824 Glenn Coppelman (617) 256-4511		X		X		Digitization and film recording of Landsat imagery, aerial photography (transparencies). Applications in forestry, geology, agriculture, land use assess- ment, digital terrain modeling.	
Public Technology, Inc. 1140 Connecticut Ave. NW Washington, D.C. 20036 Ned Buchman (203) 452-7700						Technology transfer and assis- tance to local government, user requirements evaluation, pro- ject planning, urban applications of remote sensing, geo-coded information systems, decision support systems, impact assess- ment, transportation planning, energy conservation.	Non-profit, tax exempt, public interest R&D, technology transfer organization. Services available on an annual sub- scription basis to local govern- ments.
Radian Corporation 8500 Shoal Creek Austin, Texas 78758 Dr. Dennis Harner (512) 454-4797				X	X	Surface mine reclamation planning, regional land use inventories, forest inventories.	

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing and Interpretation	Optical	Digital	Landsat Analysis & Processing	Landsat Data	Application Specialties	
Seiscom Delta, Inc. Digital Images Division P.O. Box 36938 Houston, Texas 77036 Brian T. Fine (713) 776-3083			X	X	X	Digital image processing and display systems. Acreage estimates, land cover mapping, bathymetry, seismic interpretation.	
Spatial Data Systems, Inc. 508 S. Fairview Ave. P.O. Box 249 Goleta, California 93017 M. S. Schlosser (805) 967-2383	X		X	X			Multi-spectral analysis and image processing systems (software and hardware), scanning microdensitometers, image enhancement equipment.
Spectral Data Corporation 112 Parkway Dr. South Hauppauge, New York 11787 Dr. Edward Yost (516) 543-4441 William Smith (703) 243-0660	X			X	X	Remote sensing training.	Recent involvement in training programs in Nairobi, Kinshasa, and Ouagadougou (Africa).
Stanford Technology Corp. (International Imaging Systems, I ² S Division) 650 North Mary Avenue Sunnyvale, California 94086 Marge Pace (408) 737-0200	X		X	X		Digital image processing systems, earth resources applications (Landsat).	

Organization and Contact Person	Hardware		Software		Services		Comments
	Remote Sensing and Interpretation	Digital	Landsat Analysis & Processing	Landsat Data	Application	Specialties	
Technical Photo Inc. 10315 Kensington Parkway Kensington, Maryland 20795				X		Landsat composites; prints and transparencies; image enhancement; film processing and related services.	Photographic laboratory specializing in Landsat images and servicing tech- nical organizations, research firms, and governments.
John L. Milne (301) 942-7600							
Texas Instruments, Inc. Geological Services P.O. Box 225621, M/S 3956 Dallas, Texas 75265				X		Landsat interpretation for mineral and hydrocarbon investigations.	
David D. Van Wart (214) 238-2813							
TRW DSSG One Space Park 55/2818 Redondo Beach, California 90278			X	X		X	
Herbert Greenbaum (213) 536-1271							
Woodward-Clyde Consultants 1425 Broad Street Clifton, New Jersey 07012				X		Geologic interpretation of remote sensing data.	Location of geologic faults for nuclear power plant and dam siting, geologic structure for oil/minerals exploration.
Dr. James W. Smith (201) 471-2000							

Assistance Sources Federal and State Agencies

Federal and State Agencies

EROS Data Center

Applications Branch

EROS Data Center

U.S. Geological Survey

Sioux Falls, South Dakota 57198

(605) 594-6511/FTS: 784-7511

EROS Applications Assistance Facility

U.S. Geological Survey

National Space Technology Laboratories

NSTL Station, Mississippi 39529

(601) 688-3541/FTS: 494-3541

EROS Applications Assistance Facility

U.S. Geological Survey, Geophysical Institute

University of Alaska, Fairbanks, Alaska 99701

(907) 479-7487/FTS: 399-0150

(Seattle operator will connect to Fairbanks number)

EROS Applications Assistance Facility

HQ Inter-American Geodetic Survey

Headquarters Building, Drawer 394

Fort Clayton, Canal Zone

(Ask overseas operator for

Fort Clayton 33-8334)

National Cartographic Information Center

National Cartographic Information Center

U.S. Geological Survey, 507 National Center

Reston, Virginia 22092

(703) 860-6045/FTS: 928-6045

Eastern Mapping Center

National Cartographic Information Center

U.S. Geological Survey, 536 National Center

Reston, Virginia 22092

(703) 860-6336/FTS: 928-6336

Mid-Continent Mapping Center

National Cartographic Information Center

U.S. Geological Survey, 1400 Independence Road

Rolla, Missouri 65401

(314) 364-3680, Ext. 107/FTS: 276-9107

National Space Technology Laboratories

National Cartographic Information Center

U.S. Geological Survey, Building 1100

NSTL Station, Mississippi 39529

(601) 688-3544/FTS: 494-3544

Rocky Mountain Mapping Center

National Cartographic Information Center

U.S. Geological Survey

Stop 504, Box 25046, Federal Center

Denver, Colorado 80225

(303) 234-2326/FTS: 234-2326

Western Mapping Center

National Cartographic Information Center

U.S. Geological Survey, 345 Middlefield Road

Menlo Park, California 94025

(415) 323-8111, Ext. 2427/FTS: 467-2427

National Conference of State Legislatures

Mr. Paul A. Tassar,
Director, Satellite Remote Sensing Project
National Conference of State Legislatures
1405 Curtis Street, 23rd Floor, Denver, Colorado 80202
(303) 623-6600

National Governors' Association

Ms. Peggy Harwood,
Staff Associate for Natural Resources,
Council of State Planning Agencies
Hall of the States, 444 North Capitol Street
Washington, D.C. 20001
(202) 624-7727

State Agencies (with centralized remote sensing programs)

Arizona

Michael S. Castro
Arizona Resources Information System
1812 West Monroe, Suite 202, Phoenix, Arizona 85007
(602) 271-4061

California

Tim Hays
Project Director, Environmental Data Center
Office of the Governor, Office of Planning and Research
1400 Tenth Street, Sacramento, California 95814
(916) 322-3784

Florida

Bill Kuyper
Remote Sensing Engineer, State Topographic Office
Department of Transportation, Haydon Burns Building
Tallahassee, Florida 32304
(904) 488-2168

Georgia

Bruce Q. Rado
Georgia Department of Natural Resources
270 Washington Street, S.W., Room 700
Atlanta, Georgia 30334
(404) 656-3214

Idaho

Alan Porter
Division of Budget, Policy Planning and Coordination
State House, Boise, Idaho 83720
(208) 554-3900

Iowa

Bernard Hoyer
Iowa Geological Survey
123 North Capitol, Iowa City, Iowa 52242
(319) 338-1173

Kentucky

John Antenucci
Department of National Resources and Environmental
Protection, 407 Capitol Plaza Towers
Frankfort, Kentucky 40601
(502) 564-2340

Maryland

Tom Rugoski
Department of State Planning
State Office Building, Room 1101
301 West Preston Street, Baltimore, Maryland 21201
(301) 383-2472

Minnesota

Donald P. Yaeger
Mapping and Remote Sensing Information Center
State Planning Agency, 15 Capitol Square Building
St. Paul, Minnesota 55101
(612) 296-1211

Mississippi

Eddie Downing
Research and Development Center
P.O. Box 2470, Jackson, Mississippi 39205
(601) 982-6339

Montana

Thomas Dundas
Remote Sensing Information Systems Division
Department of Community Affairs
Capitol Station, Helena, Montana 59601
(406) 449-8296

New Jersey

Richard Binetsky
New Jersey Department of Community Affairs
P.O. Box 2768, Trenton, New Jersey 08625
(609) 292-8917

New Mexico

Gerald Gates
Department of Fish and Game
Villagra Building, Santa Fe, New Mexico 87503
(505) 827-5446

North Carolina

John Higgins
Department of Natural Resources and Community Development
P.O. Box 27687, Raleigh, North Carolina 27611
(919) 733-2090

Ohio

Garry Schaal
Ohio Department of Natural Resources
Fountain Square, Columbus, Ohio 43224
(614) 466-6557

Oregon

Ken Hansen
Land Conservation and Development Commission
1175 Court Street, N.E., Salem, Oregon 97310
(503) 378-2978

South Carolina

Gerald Minick
South Carolina Land Resources Conservation Commission
2221 Devine Street, Columbia, South Carolina 29205
(803) 758-7197

South Dakota

Dick Gebhart
Land Resource Information System
State Planning Bureau
State Capitol, Pierre, South Dakota 57501
(605) 773-3628

Texas

Samuel McCulloch
Texas Natural Resources Information System
P.O. Box 13087, Capitol Station, Austin, Texas 78711
(512) 475-3321

Vermont

M. Brian Stone
Chief of Project Management
Department of Forest, Parks and Recreation
Agency of Environmental Conservation
Montpelier, Vermont 06502
(802) 828-3375

Virginia

Robert F. Hutcheson
Department of Agriculture and Consumer Service
203 North Governor St., P.O. Box 1163
Richmond, Virginia 23219
(804) 786-4712

Washington

Mike McCormick
Office of Community Development
Room 400, Capitol Center Building
Olympia, Washington 98504
(206) 753-2425

In addition, Landsat data users may receive assistance from NASA sources listed on the inside back cover of this publication.